

CHAPTER 18: ENVIRONMENTAL QUALITY

When considering Fort Worth's future growth and the needs of its citizens, protecting and enhancing environmental quality is a top issue. How the City chooses to grow could have significant impacts on the surrounding environment in terms of its sustainability.

This chapter is intended to consolidate the many environmental concerns facing the City, and to identify the management practices that will most effectively address these issues. The topics that will be covered in this chapter include solid waste, air quality, energy conservation, water quality and supply, drainage, endangered species, sustainable development, and natural habitats.

EXISTING CONDITIONS AND TRENDS

To plan for the future, the City must know its current status. By assessing current environmental conditions, a baseline can be established against which the importance and impact of future decisions can be measured.

Solid Waste

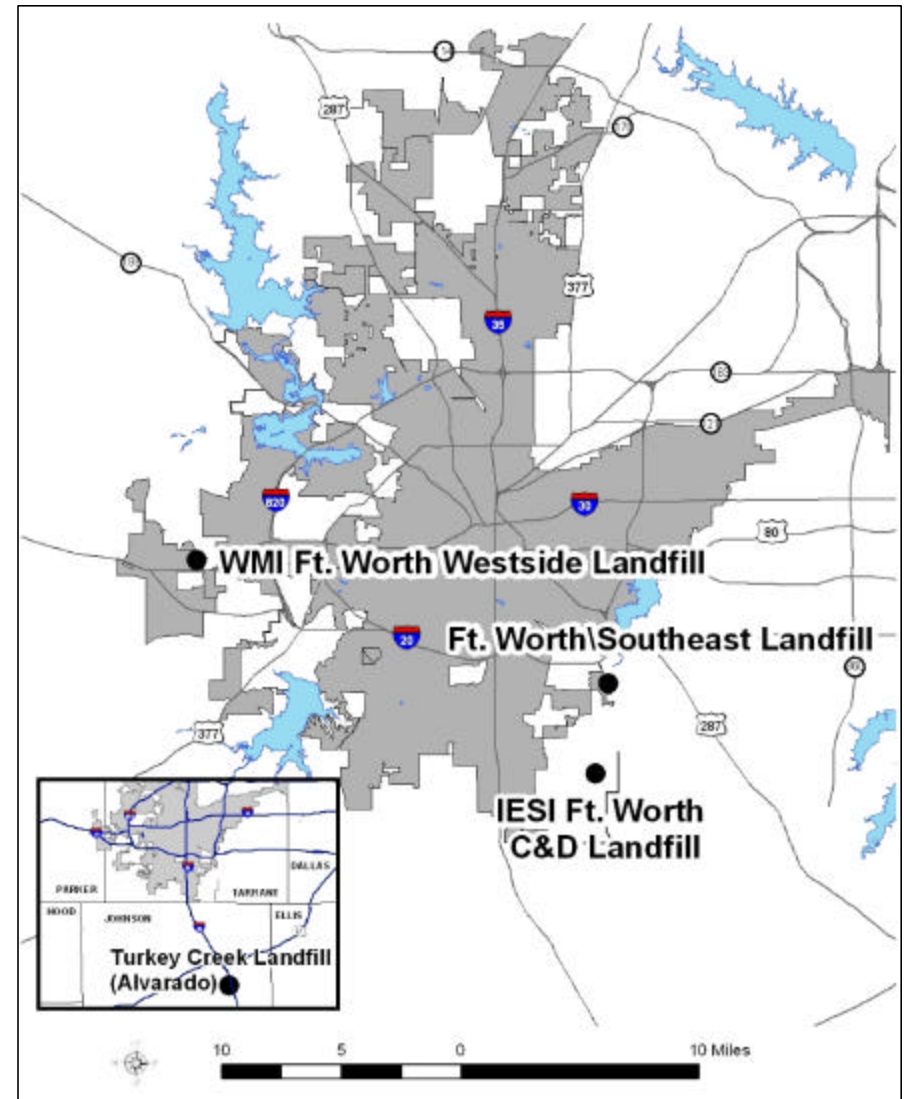
In fiscal year 2004, the City of Fort Worth collected 282,066 tons of residential garbage, recycling, brush and bulky waste from 161,846 households. The North Central Texas Council of Governments (NCTCOG) estimates that the total municipal waste stream in Fort Worth will be 1.1 million tons by the year 2020.

NCTCOG also estimates that approximately 33 percent of the city's waste is generated by residential land uses, while approximately 67 percent is produced by commercial and industrial uses. A private collection company collects the residential waste from Fort Worth households. Several private firms collect waste produced by commercial and industrial uses. Once collected, the waste is transported to a landfill for disposal or to a material recovery facility to be processed for recycling. Prior to the start of the new solid waste collection program the residential recycle diversion rate varied from 5 percent to 8 percent of the waste stream. Since the start of the new program in April 2003, approximately 21 percent of residential solid waste collected curbside is recycled in Fort Worth. This includes both material collected as single-stream recyclables and yard waste.

Most of the waste produced in Fort Worth is delivered to landfills. Four landfills currently handle the bulk of the city's waste: the Southeast Landfill, which is owned by the City and operated by a private contractor, receives the residential waste; yard waste and non-putrescible bulk wastes are either processed for mulch or disposed at the privately owned Fort Worth Construction and Demolition (C&D) Landfill; and the privately owned Westside and Turkey Creek Landfills receive the majority of the commercial and industrial wastes.

Starting with the City's new Solid Waste Plan in April 2003, Fort Worth has operated two temporary Citizens Convenience Stations. Known as drop-off stations, these

Municipal Landfills



The four main landfills used for the disposal of solid waste generated within Fort Worth are the City's Southeast Landfill, the IESI Corporation Fort Worth C&D Landfill, the Waste Management Westside Landfill and the Trinity Waste Services Turkey Creek Landfill in Johnson County. (Source: Environmental Management Department, 2004.)

facilities offer a free alternative to residents of Fort Worth to take bulky waste and brush to the drop-off stations instead of setting these materials out at the curb or hauling waste to a landfill and paying a tipping fee for disposal. During fiscal year 2004, the drop-off stations received over 24,000 tons of waste materials which was subsequently transported to a landfill for disposal. These two temporary drop-off stations are located at 3224 Yuma Street and 2400 Brennan Avenue. The permanent sites will be located at 2400 Brennan Avenue and 5150 MLK Freeway. The temporary site on Yuma will close in 2006 upon the opening of the new permanent MLK site. Both permanent sites are scheduled to be operating in the fall of 2005.

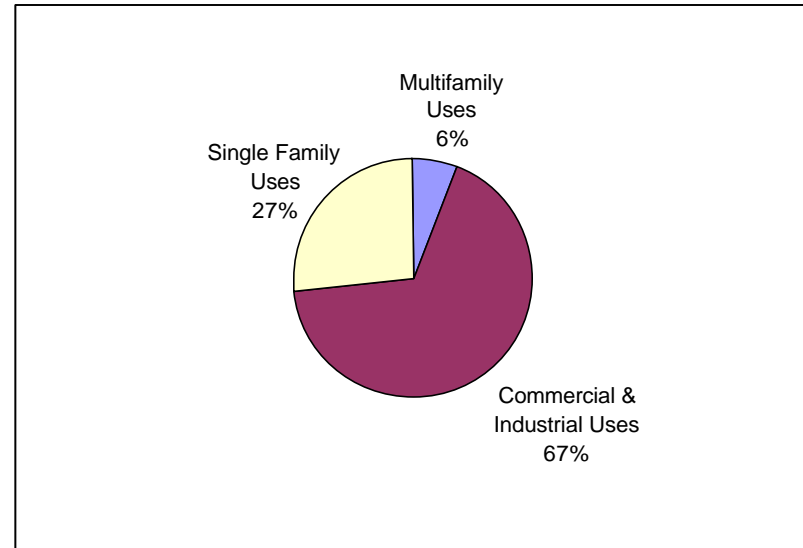
Since December 1997, the Environmental Management Department has operated a year-round regional household hazardous waste collection facility, the Environmental Collection Center, in support of its Municipal Separate Storm Sewer System permit. The facility provides service to 27 municipalities, unincorporated areas of Tarrant County, the Tarrant Regional Water District and the Upper Trinity Regional Water District. Mobile units travel to collect household hazardous waste at neighborhood locations, as well as in some surrounding cities. In fiscal year 2004, the facility collected and disposed 1,000 tons of household hazardous waste from 20,846 households. This is waste that otherwise might have found its way into the City's landfills or waterways.

Significant changes to the City's solid waste program took effect in the spring and summer of 2003. The program provided to residential customers combines weekly variable-rate garbage collection in carts, weekly single stream recycling collection in carts, weekly yard waste collection in special bags and carts, and monthly bulky waste collection. The City's goals for the new solid waste contracts are to make the city cleaner and more attractive, provide residents with efficient, cost-effective service, and increase Fort Worth's recycling/diversion rate.

Air Quality

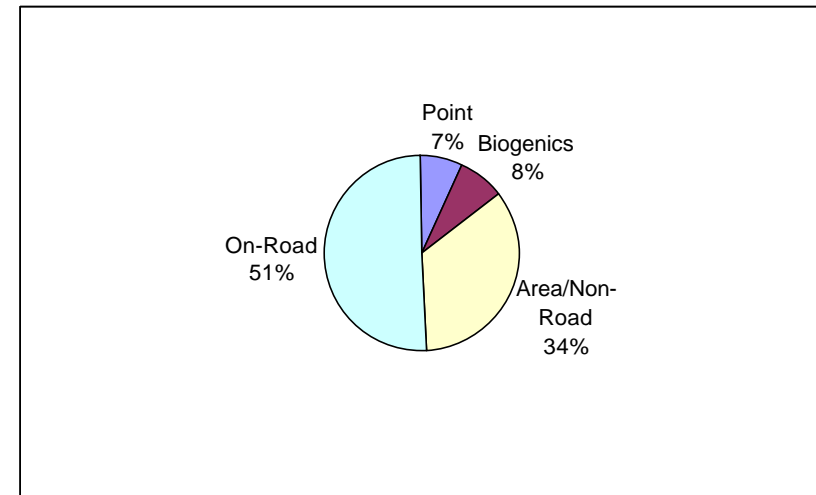
Air pollution is a problem facing most major urban areas. In the Metroplex, the primary form of air pollution is ground level ozone. In 2005, the American Lung Association ranked Dallas/Fort Worth collectively as the eighth most ozone-polluted city in the country, and Tarrant County as the 11th most ozone-polluted county. Ozone is a colorless, odorless gas that is present both in the upper atmosphere and at ground level. The ozone that is present in the upper atmosphere protects the earth from harmful ultraviolet radiation. Ozone that is present at ground level is the chief component of smog. Ground level ozone is formed when pollutants react chemically in the presence of sunlight. Ground level ozone can affect health in a number of ways, including irritation of the respiratory system, reduction of lung function, aggravation of asthma, and inflammation or damage to the lining of the lungs. There are two major pollutants that cause the formation of ground level ozone: volatile organic compounds (VOCs) and nitrogen oxides (NOx). Estimates projected from implementation of federal, state and local emission reduction initiatives show that seven percent of these pollutants will come from point sources, eight percent from biogenics, 34 percent from area and non-road sources, and 51 percent from on-road vehicles in North Central Texas in 2007.

Sources of Solid Waste



Commercial and industrial uses create a higher percentage of waste than multifamily or single family uses. (Source: *Regional Solid Waste Management Plan For North Central Texas, NCTCOG, 1998.*)

Estimated Sources of Major Air Pollutants (NOx) in North Central Texas — 2007



Ground level ozone is formed when pollutants react chemically with sunlight. In North Central Texas, the greatest source of these pollutants is on-road vehicles. (Source: *State Implementation Plan, TCEQ, 2003.*)

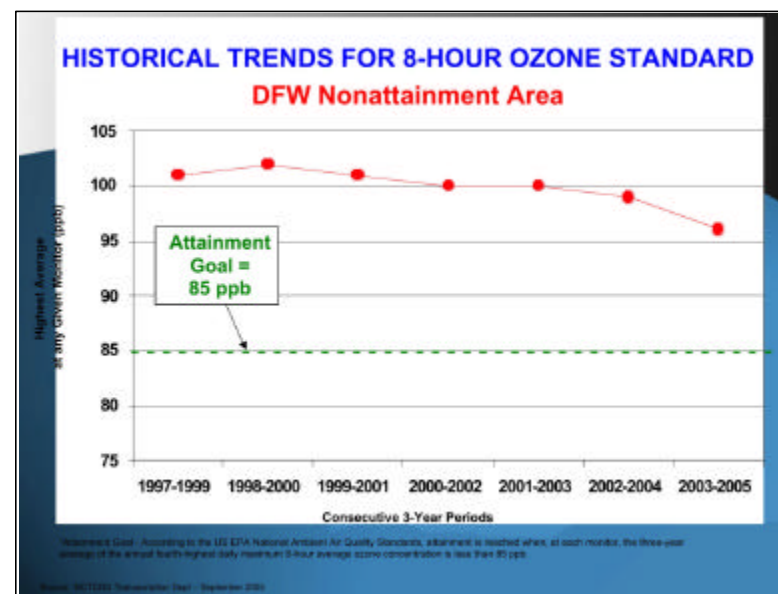
In 1998, the U.S. Environmental Protection Agency (EPA) classified the counties of Collin, Dallas, Denton and Tarrant as an area of serious non-attainment under the federal one-hour ozone standard. As part of that designation, pollution levels in the area were not to exceed the federal one-hour ozone standard more than three days during any three-year monitoring period. EPA also required the four-county area to prepare and implement a State Implementation Plan (SIP), which included initiatives to help reduce ozone-forming emissions in the future. In the monitoring period from 1997 to 1999, the region exceeded the federal one-hour standard 26 times, which could have caused the EPA to downgrade the region to severe non-attainment.

However, on April 15, 2004, EPA made its final designation for an eight-hour ozone non-attainment area comprising Collin, Dallas, Denton, Tarrant, Ellis, Johnson, Kaufman, Parker, and Rockwall, counties. The nine-county designation became effective on June 15, 2004. EPA created the eight-hour ozone standard in July 1997, based on information demonstrating that the one-hour standard was inadequate for protecting public health. Ozone can affect human health at lower levels, and over longer exposure times than one hour. The eight-hour standard is much more difficult to attain. Under the one-hour standard, any hourly average of 125 ppb or higher of ozone at any regional air monitor is an exceedance. Under the eight-hour standard, any eight-hour average of 85 ppb or higher of ozone is an exceedance. In 2005, the region exceeded the eight-hour standard 44 times compared to 55 times in 2004.

With the eight-hour designation, the Dallas-Fort Worth (DFW) region's classification level changed from serious to moderate. The Clean Air Act specifies that the maximum period for attainment for a moderate area is six years from the effective date of designation, which gives the DFW region an attainment date of June 15, 2010. The region's classification had been high because of the inability to meet the one-hour standard in the past. The DFW region is being classified at a lower level based on the difference between the one-hour and eight-hour standard definitions and also on eight-hour ozone design values.

In 2004, the North Central Texas Council of Governments' (NCTCOG) Regional Transportation Council updated *Mobility 2025*, the Metropolitan Transportation Plan. This plan focuses on improving transportation conditions through sustainable initiatives. Further, it is committed to ensuring that the region's transportation efforts are consistent with its air quality objectives by supporting local initiatives for town centers, mixed use growth centers, transit-oriented development, infill/brownfield development, and pedestrian-oriented projects. It has objectives to complement rail investments with investments in park and ride, bicycle, and pedestrian facilities, and to reduce the growth in vehicle miles traveled per person. Implementation of *Mobility 2025* could significantly reduce VOC and NOx emissions in the region. More information on traffic congestion and transportation improvements can be found in Chapter 11: Transportation. The development of pedestrian and transit-oriented mixed-use growth centers described in Chapter 4: Land Use is consistent with *Mobility 2025*.

Dallas/Fort Worth Ozone History 1990-2004 Number of Exceedance Days



The average number of exceedance days between 1990 and 2004 was six per year. This average surpasses the maximum of three days per monitoring period established by the U.S. EPA National Ambient Air Quality Standards. (Source: NCTCOG, 2004.)

Energy Conservation

Since 1970, Texas has nearly doubled both its population and its annual energy consumption. Texas ranks second in population, behind California, but according to the U.S. Department of Energy, Energy Information Administration, in 2001 Texas ranked #1 among the states in energy consumption. Texans used 12.029 quadrillion Btu or 12.5% of all energy consumed in the U.S. In fact, Texans consumed more energy than #2 consumer California and #3 consumer Florida combined! By sector, Texas ranked #1 in residential energy consumption, #2 in commercial energy consumption, #1 in industrial energy consumption, and #2 in transportation energy consumption. By fuel source, Texas ranked #2 in coal consumption, #1 in natural gas consumption, #1 in petroleum consumption and #1 in electricity consumption. Although Texas' total annual energy consumption per capita has dropped from its 1980 peak of 636.66 million Btu to 579.01 million Btu in 2000, residential consumption has shown a steady rise. In 1960 each Texan was using 38.32 million Btu of energy in their homes annually, but by 2000 that usage had nearly doubled to 74.59 million Btu annually. By contrast, California's per capita residential energy usage in 2000 was 43.02 million Btu.

Most electricity is still generated using fossil fuels (coal and natural gas), and the Texas Commission on Environmental Quality (TCEQ) has identified the electric industry as a major stationary source of air pollution in the state, particularly of nitrogen oxides (NO_x). NO_x contributes to the formation of ground-level ozone (smog). As described in the section on Air Quality, the EPA classifies the Dallas-Fort Worth region as a moderate ozone non-attainment area. Ground-level ozone causes health problems by damaging lungs, is responsible for one to two billion dollars in reduced crop production in the United States each year, and hastens the deterioration of electronic devices and materials such as rubber, plastics, outdoor paints, photographic papers, and fabrics.

Another factor contributing to the formation of ground-level ozone, as well as the high consumption of electricity, is a phenomenon called the "urban heat island effect." In the summer, urbanized areas can be up to 10° F warmer than the surrounding countryside. The displacement of trees and shrubs by roadways, parking lots, and buildings eliminates the cooling effects of shade and evapotranspiration. Evapotranspiration occurs when plants secrete or transpire water through their leaves. The water draws heat as it evaporates, cooling the air in the process. According to the Lawrence Berkeley National Laboratory, a single, mature, and properly watered tree with a crown of 30 feet can evapotranspire up to 40 gallons of water in a day, removing a heat equivalent to that produced in four hours by a small electric space heater.

Although plants cool the air, buildings and roads often increase ambient air temperature. Materials used in paved surfaces and buildings are quite efficient at absorbing solar radiation rather than reflecting it back into the atmosphere. This causes surface temperatures as well as the outdoor ambient temperature to rise, which in turn leads to increased ozone formation. The darker the material used, the greater

Urban Heat Island Strategies



Green roof on Atlanta City Hall



Green roof on Hamilton Apartments, Portland, Oregon, owned by the Housing Authority of Portland.

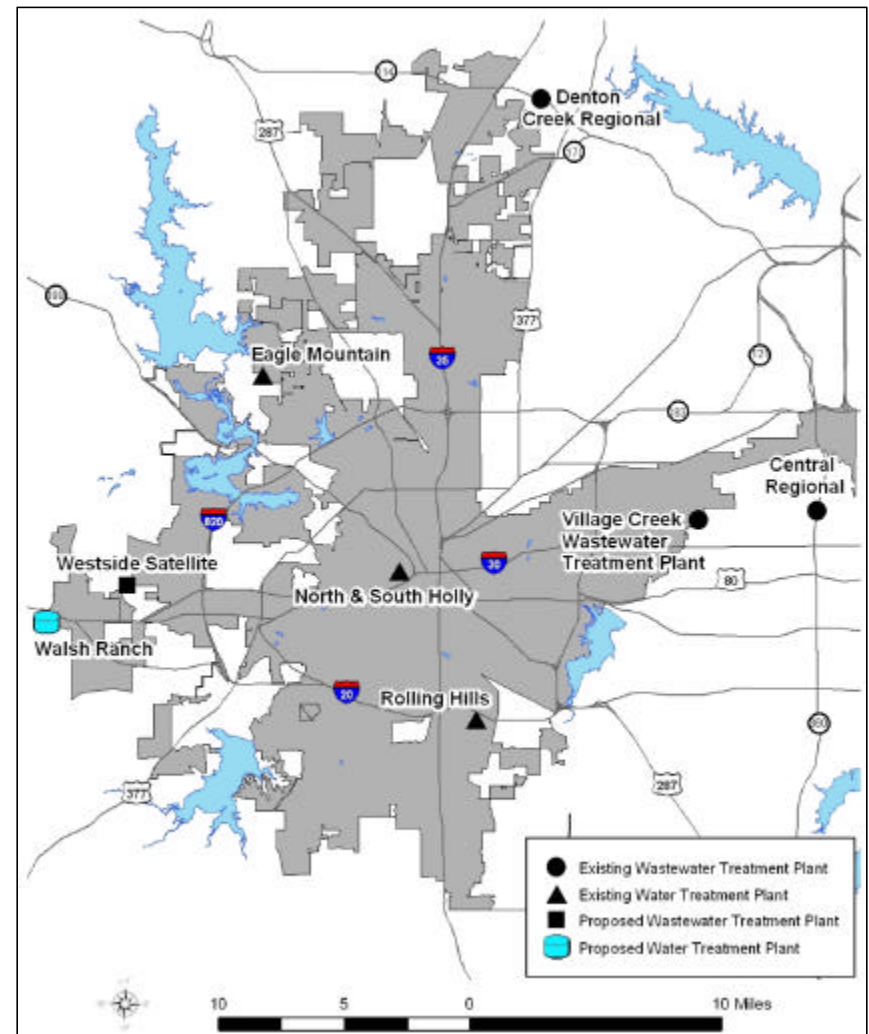
The City of Atlanta installed a green roof on its City Hall building in December 2003. The 3,000 square foot project has approximately 2,000 square feet of vegetated area and 1,000 square feet of pavers. From 1988 to 1998 the city lost 190,000 acres of tree cover due to development, and downtown Atlanta is now often 10 degrees warmer than outlying areas. The city is studying the use of green roofs as a way to counteract the urban heat island effect. The City of Portland, Oregon, officially recognizes the use of green roofs to reduce the effect of storm water runoff on local waterways. City grants have helped fund 14 green roofs in Portland, including office buildings and apartments. The City of Fort Worth will explore similar strategies to reduce energy consumption at municipal facilities.

the increase in temperature. In the sun, black surfaces can become up to 70°F hotter than the most reflective white surfaces. If the surface is a roof, the absorbed heat also increases the structure's indoor temperature, which in turn increases the demand for electricity to cool the structure to a comfortable level. The resulting increased demand on power plants increases their emission of NO_x, which in turn leads to increased ozone levels. Additionally, heat islands reduce a city's livability by decreasing urban ventilation and increasing the risk of heat-related illness. Urban heat islands have some far-reaching effects as well. NASA scientists at the Goddard Space Flight Center have recently confirmed that urban heat islands cause destabilization of the atmosphere, leading to greatly increased rainfall in areas downwind of large cities.

There are strategies to encourage the construction of energy efficient buildings. In 2001, the Texas Legislature adopted energy efficiency performance standards. The Legislature stated that an effective building energy code is essential to "reducing the air pollutant emissions that are affecting the health of residents of this state; moderating future peak electric power demand; assuring the reliability of the electrical grid; and controlling energy costs for residents and businesses in this state." To achieve energy conservation in residential, commercial, and industrial construction, the pertinent chapters of the International Residential Code and the International Energy Conservation Code, as they existed on May 1, 2001, were adopted by the Legislature. Municipalities are mandated to administer and enforce these codes within their jurisdictions. The City of Fort Worth adopted these codes, with amendments, on December 11, 2001, as the Fort Worth Energy Code, and charged the Building Official with enforcement. Another provision of the energy efficiency performance standards adopted by the Legislature is the mandate for energy efficiency programs for local governments in counties affected by ozone non-attainment. Under this requirement, each political subdivision must establish a goal to reduce its own electric consumption by five percent each year for five years, beginning January 1, 2002. The City is working to make this goal a reality for municipal facilities.

Fort Worth's population grew by approximately 3 percent annually from 534,694 in 2000 to 618,600 in 2005. The population is expected to increase to a projected level of 784,300 by 2025. Continued population and economic growth in the Dallas-Fort Worth region will place increasing demands on the state's energy resources, especially from the industrial sector, which in turn will impact our air quality. It is imperative to maintain the city's strong economic growth without compromising its environmental quality. To do this, all sectors – industrial, commercial, government, community and residential – must find ways to reduce energy consumption. Municipal facilities represent a substantial opportunity to achieve cost-effective reductions in energy consumption. As a high-profile energy consumer, the City of Fort Worth has the responsibility to promote energy conservation through the efficient use of energy within its own operations and through the implementation of common sense urban heat island reduction measures.

Water Treatment and Wastewater Treatment Facilities



The City of Fort Worth uses four plants to treat raw water to meet federal and state drinking water standards before it is delivered into the distribution system. The majority of wastewater generated within Fort Worth is treated at the Village Creek wastewater treatment plant, with the remainder treated at Denton Creek and Central Regional Wastewater Treatment Plants.

(Source: Environmental Management Department, 2004.)

Water Quality and Supply

The Water Department provides retail water service to the citizens and businesses of Fort Worth. The 2004 retail magnitude was approximately 185,616 water accounts. The City also provides wholesale water service to 29 customers, which are generally neighboring cities or water supply entities located adjacent to Fort Worth.

Fort Worth's raw water supply is provided by the Tarrant Regional Water District (TRWD) under a long-term contract, and is subject to availability and capacity of the TRWD system. Water sources include the West Fork of the Trinity River (Lake Worth and Eagle Mountain Lake), the Clear Fork of the Trinity River (released from Lake Benbrook), Richland Chambers Reservoir, and Cedar Creek Reservoir. Presently, TRWD has an adequate raw water supply for Fort Worth beyond the horizon of 2020. The current treatment capacity available to Fort Worth is approximately 425 million gallons per day (MGD). The 2004 average-day demand was 159 MGD, with a maximum-day demand of 265 MGD. The projected average-day demand for the year 2020 is 310 MGD, with the maximum-day demand for the year 2020 presently projected to be over 629 MGD.

There are four raw water treatment facilities that treat water to meet federal and state drinking water standards prior to delivery into the distribution system: North Holly, South Holly, Rolling Hills, and Eagle Mountain Water Treatment Plants. In 2003, the City completed upgrades to the North and South Holly and Rolling Hills water treatment plants that reduced existing levels of disinfection byproducts from 100 micrograms per liter to 80, and microbe levels from .5 turbidity units to .3 turbidity units. The City has also taken steps to help ensure the security of Fort Worth's water supply by completing a security vulnerability study in 2003.

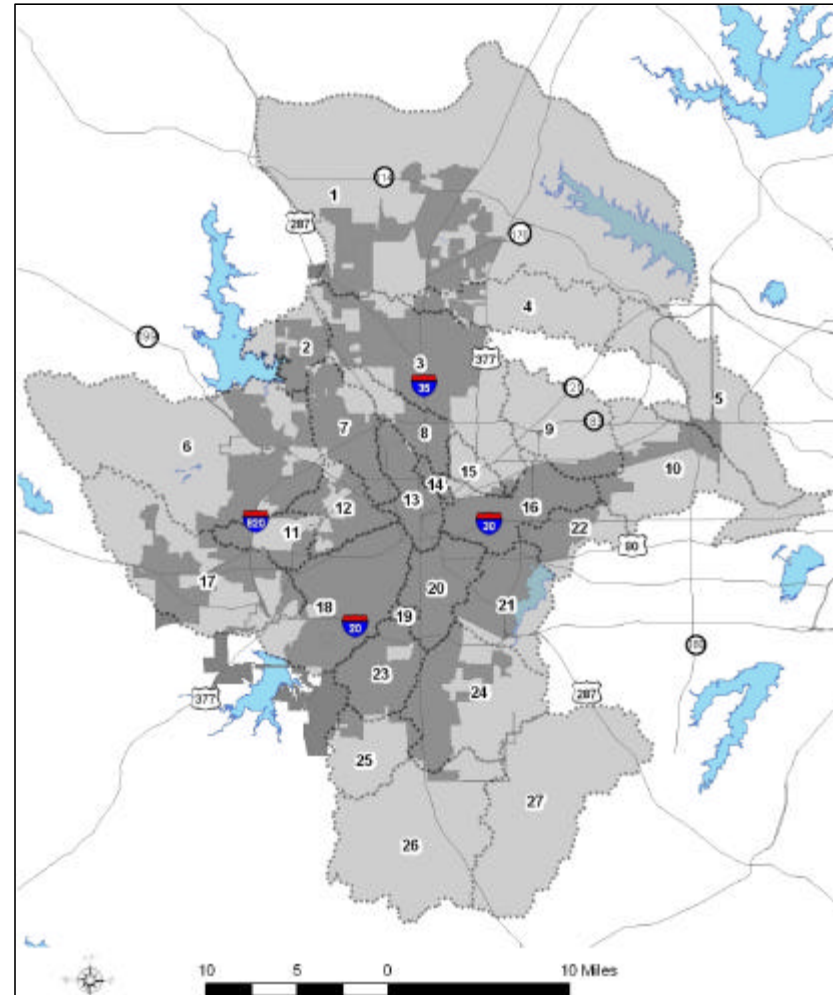
In addition to providing potable water to citizens and businesses, the City provides a system of wastewater collection and treatment. In 1999, the City completed the Wastewater Master Plan Program to identify the needs of the city as it continues to grow.

Currently, the City provides service to 178,564 retail wastewater accounts generally within the city limits. The City also provides wholesale service to 22 wastewater customers outside city limits. Fort Worth uses three major wastewater treatment plants, which provide 98 percent of the wastewater service:

- Village Creek Wastewater Treatment Plant (owned by the City of Fort Worth).
- Denton Creek Regional Wastewater System (operated by the Trinity River Authority - TRA).
- Central Regional Wastewater System (operated by the TRA).

Wastewater is treated by these plants to meet stringent water quality standards contained in federal and state permits, and then discharged to the Trinity River and its tributaries. In 2003, the City completed rehabilitation and capacity improvement projects in the wastewater collection system to eliminate sanitary sewer overflows and backups.

Watershed Boundaries



- | | | |
|------------------------------|-------------------------------|-----------------------------|
| 1. Grapevine Lake Dam | 10. West Fork Above Mountain | 19. Sycamore Tributary |
| 2. East of Eagle Mountain | 11. King's Branch | 20. Lower Sycamore Creek |
| 3. Big Fossil Creek | 12. West Fork Above Clear | 21. Lake Arlington Dam |
| 4. Upper Big Bear | 13. West Fork Above Sycamore | 22. Lower Village Tributary |
| 5. Lower Big Bear | 14. Dry Branch | 23. Upper Sycamore Creek |
| 6. Lake Worth Dam | 15. Lower Little Fossil Creek | 24. Middle Village Creek |
| 7. Marine Creek | 16. West Fork Above Fossil | 25. Deer Creek |
| 8. Upper Little Fossil Creek | 17. Mary's Creek | 26. Upper Village Creek |
| 9. Walker Branch | 18. Clear Fork Trinity River | 27. Walnut Creek |

It is important to consider watershed boundaries when examining runoff patterns and issues because water does not flow according to political boundaries; what happens in one part of the region can affect other areas downstream. (Source: Planning Department, 2004.)

Drainage

A problem facing many urbanized areas is the effect of storm water runoff in transporting non-point source pollution. Non-point source pollution is created when water runs over land and picks up debris and pollutants along the way, eventually depositing this material into lakes, rivers, and streams. Because urbanized areas have a high percentage of impervious surfaces, water has fewer places to infiltrate and is quickly channeled into water bodies, along with the pollutants it picks up.

In December 1996, the City was issued a National Pollutant Discharge Elimination System (NPDES) permit to discharge from the City's separate storm water sewer system into waters of the United States. A major provision of this permit was the minimization of non-point source pollution in areas of new development and significant redevelopment, and the City developed planning procedures to address these issues.

In addition to preventing pollutants from entering storm water runoff, the City is concerned with improving existing drainage and preventing future flooding and erosion associated with development. Like many cities, Fort Worth has areas with substandard infrastructure for drainage, primarily in older areas developed prior to current standards. Storm water runoff is not subject to man-made boundaries like neighborhoods, council districts, or sectors. What happens in one part of the city can affect other areas downstream. For this reason, issues pertaining to storm water and drainage should be investigated on a watershed basis. Because Fort Worth has grown substantially within the last 20 years, and has room for continued substantial growth over the next 20 years, drainage issues need to be addressed on a watershed basis when new developments or significant redevelopments are under consideration. In November 2002, 55 local governments kicked off a regional effort to more effectively manage storm water impacts through the *integrated* Storm Water Management (iSWM) program. The iSWM initiative, coordinated by NCTCOG, will help the region achieve environmental goals, foster partnerships with state & federal agencies, and provide guidelines for comprehensive storm water management. A iSWM Policy Guidebook and related Design Manual for Development and Redevelopment, which are currently in draft form, will provide the most current and applicable storm water management techniques that are applicable to site planning and construction. Extensive future Capital Improvement Projects, however, will be required to bring the numerous existing undersized storm drain systems up to current standards.

Major flooding in Tarrant County generally occurs as a result of heavy rainfall from frontal type storms, which are most frequent in the spring and summer months. Man-made reservoirs and levees have significantly altered flood flows. The City of Fort Worth has in place a Federal Flood Insurance Program, which regulates development in floodplain areas in the city and other areas under its jurisdiction and control. The City has amended this regulation to comply with the Federal Emergency Management Agency's (FEMA) new standards, procedures, policies, and guidelines. However, most structure flooding in Fort Worth occurs along storm drain lines and minor streams which are not regulated by the FEMA Flood Insurance Program.

Keep Fort Worth Beautiful Program



The Keep Fort Worth Beautiful Program educates citizens on methods to reduce the amount of solid waste disposal. (Source: Environmental Management Department, 2006.)

Endangered Species and Natural Habitat

In Tarrant County, there are three endangered or threatened species of animals: the Interior Least Tern, the Bald Eagle, and the Whooping Crane. The Least Tern can be found in habitats along the Trinity River, which has broad sandbars and barren shoreline. The Least Tern has declined in population due to the construction of reservoirs and channelization projects that exacerbate habitat flooding problems, water pollution, and increased vegetative growth in habitat areas.

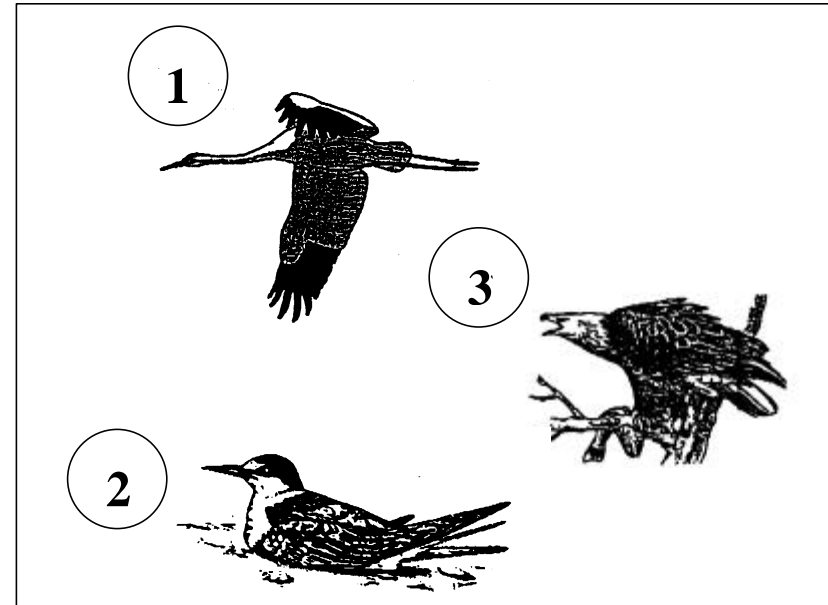
The Bald Eagle has been documented in recent years at Lake Worth, and has reportedly been seen near Lake Benbrook. The eagles like areas near river systems or large water bodies. They use tall trees located close to marshes or lakes to nest. Due to a recent increase in population, their classification was reduced from endangered to threatened in 1995. Current threats include loss of habitat from continued development and lead poisoning.

The Whooping Crane has historically used the Dallas-Fort Worth area as part of its regular migratory route. Recently, there has only been one sighting in Tarrant County. These large birds frequent marsh areas, river bottoms, and prairie and croplands—areas away from development that have plenty of vegetation and water. According to the U. S. Fish and Wildlife Service, they are currently threatened by the destruction of wintering and breeding habitats, entanglement in human structures like power lines and fences, and poaching.

In addition to the three birds, two plants warrant mentioning. These are the False Auriculate Foxglove and the Comanche Peak Prairie-Clover. The False Auriculate Foxglove is listed on the State historical list of plants for this area, but has not been seen since the turn of the last century in Tarrant County. It is listed because the proper habitat exists here and is found in some contiguous states. The Comanche Peak Prairie Clover is found in Parker and Wise counties. The proper habitat is found in Tarrant County, but only 6-20 populations are estimated statewide.

Within the greater Fort Worth area, there are four primary north central Texas ecosystems: the Grand Prairie, Western Crosstimbers, Eastern Crosstimbers, and the Trinity River Bottomland. The Grand Prairie typically consists of clay-based limestone soils. The soil cover can range from very thin, rocky, and dry on hilltops, to thicker covers on slope and bottom areas. The majority of the vegetation in this area is typically tall and mid grasses, with dispersed populations of wildflowers. Eastern and Western Crosstimbers are distinguished by their sandy or clay soil structures. The soil layer in these ecosystems is usually deeper and has more water-bearing potential than that of the Grand Prairie. Vegetation in these areas includes post oak, blackjack oak, tall and mid grasses, with small amounts of wildflowers. The Trinity River Bottomland is characterized by deep clay soils. Vegetation includes tall and mid grasses and a variety of flood plain trees, such as pecan, American elm, sugar hackberry, green ash, and cottonwood.

Endangered and Threatened Species



The two endangered species in the Fort Worth area are the Whooping Crane (1) and the Interior Least Tern (2). Once classified as endangered, the Bald Eagle (3) is now classified as threatened due to an increase in population. (Source: U.S. Fish and Wildlife Service, 1999.)

Sustainable Development

In recent years, a new approach to environmental planning has emerged — sustainable development. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. This approach promotes development with limited environmental impacts. As population increases and land availability and resources decrease, it becomes ever more important to consider the long-term ramifications of growth. Likewise, the strain on City resources can be impacted from populations far outside city limits. Cities like Chicago, Illinois, Austin, Texas, and Portland, Oregon, have programs in place to address these issues. Some include incentives to use natural vegetation to reduce water consumption, using more energy-efficient building materials to lower the demand on power sources, and using construction materials that are reusable or created from recycled material.

The Brownfields Economic Redevelopment Program is a component of the City's broader sustainable development initiatives. Brownfields are "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." The mission of the program is to encourage the redevelopment of economically distressed areas in Fort Worth through the integration of environmental assessment, remediation and education. The program encompasses the entire city, but targets City Council Districts 2, 5, and 8. These districts have the highest minority populations in the city and are also the most economically disadvantaged. An inventory of Fort Worth's potential brownfield sites now tops 340 facilities. Approximately 72 percent of the identified sites are located in the targeted council districts. The vast majority of the sites in the inventory are a fraction of an acre in size, further complicating their redevelopment potential.

The objectives of brownfields redevelopment include reducing perceived and actual health problems associated with living and working in proximity to contaminated properties, reducing crime associated with abandoned buildings, increasing public awareness of issues associated with brownfields, and securing community involvement in remediation and redevelopment.

The Fort Worth Brownfields program began as a pilot in 1999 with a \$200,000 U.S. Environmental Protection Agency (EPA) assessment grant. A supplemental grant of \$200,000 was received two years later. In June 2004, the City of Fort Worth was selected by EPA to receive a new \$400,000 brownfields assessment grant. The grant funding will be used to conduct an inventory of sites, perform Phase I and II site assessments, and prepare cleanup plans for hazardous substances and petroleum contamination. Fort Worth also has a \$1 million brownfields cleanup revolving loan fund from the EPA, to be used to provide low interest loans for brownfields cleanup. In addition, in 2004 the Fort Worth Opportunity Center received a \$200,000 brownfields cleanup grant to clean up hazardous substances contamination on the former Anderson Laboratories, Inc. property, which the Opportunity Center occupies.

Air Quality Programs



An important component of the State Implementation Plan (SIP) is AirCheck Texas, the Motor Vehicle Emission Inspection and Maintenance Program that went into effect on May 1, 2002, in Collin, Dallas, Denton, and Tarrant counties. (Source: *Environmental Management Department, 2002.*)



An "Air Pollution Watch" will be issued for a day predicted to be a public health risk. TCEQ issues an "Air Pollution Warning" if air pollution levels actually reach unhealthy levels based on monitor readings. Ozone levels are represented by various colors in the warnings to easily convey the severity of air pollution. For example, purple indicates a very unhealthy level of ozone, while orange indicates that levels are unhealthy for sensitive groups. (Source: *Environmental Management Department, 2004.*)

GOALS AND OBJECTIVES

At their June 2005 retreat, the Mayor and City Council revised the following goals related to environmental quality: create and maintain a clean, attractive city and improve mobility and air quality. The City has identified the following categorized goals and objectives to help achieve the City Council's broader strategic goals and to address current and future needs.

Solid Waste

Make Fort Worth cleaner and more attractive by enhancing solid waste services through a new collection program and provider contract implemented in spring 2003.

- Through curbside recycling, increase the amount of waste diverted from landfills from the current 6 percent to more than 25 percent by the end of 2006.

Air Quality

Improve Fort Worth's and the region's air quality through reduction of pollutants.

- Work in cooperation with TCEQ, NCTCOG, and other cities in the Dallas-Fort Worth Metroplex to bring the region into attainment for ozone by June 15, 2010.
- Comply with EPA mandates for the next monitoring period.
- Implement Mobility and Air Quality Plan

Energy Conservation

Make Fort Worth a cleaner and healthier city through a strong commitment to energy conservation.

- Through energy planning, reduce electricity consumption rates by the City of Fort Worth by at least five percent each year for five years, beginning January 1, 2002.

Water Quality, Supply, and Drainage

Maintain a high level of water quality for current usage, and accommodate future development.

- Create new reservoirs along the Sulfur River to accommodate future growth after the year 2020.

Maintain or improve current water quality by reducing non-point source pollutants associated with new and extensive redevelopment.

- Regularly update policies and procedures to control water pollution caused by storm water runoff, so as to comply with Fort Worth's National Pollutant Discharge Elimination System (NPDES) storm water permit.

Reduce flooding through maintenance and improvements of drainage features.

- Prepare an inventory of existing drainage structures in Fort Worth by the end of 2006.

Endangered Species and Natural Habitat

Preserve natural habitat and protect endangered or threatened species.

- Prepare an inventory of natural habitats and species within the Fort Worth area by the end of 2006.

Care for Cowtown Air



Care for Cowtown Air is a program administered by the City of Fort Worth Environmental Management Department. The program helps to improve air quality by offering incentives to City employees who participate in ozone reducing activities during the ozone season, May through October. Ozone reducing activities include bringing a lunch to work, walking to lunch, riding a bus, a bike, or carpooling to work, telecommuting, or using flex-time. (Source: Environmental Management Department, 2004.)

- Begin to propagate and restore populations of native plant species in Fort Worth by 2006.

Sustainable Development

Redevelop abandoned industrial and commercial sites, or brownfields, to help reuse land in the central city.

- Continue identification of potential brownfields redevelopment candidates, focusing on the central city.
- Perform three Phase I environmental site assessments of selected project sites, and facilitate the redevelopment of the sites by the end of 2006.
- Continuing developing Fort Worth's Project XL program—the demolition of regulated structures—to create a more economical way for local governments to demolish substandard nuisance containing asbestos, while protecting the environment and the public health.
- Continue working with the U.S. Environmental Protection Agency and the Texas Department of Health for regulatory flexibility to proceed to Phase 2 of Project XL by the end of 2006.
- Create a Brownfields Redevelopment Guidebook to help educate potential developers on the City's brownfields program, the process needed to redevelop a site, and any funding and other incentives available by the end of 2006.

POLICIES AND STRATEGIES

The following policies and strategies will enable the City to implement its environmental quality goals and objectives:

Solid Waste Current Policy

- Pursue methods to minimize wastes, reduce recycling contaminants, re-use or recycle wastes, and assure long term disposal capacity.

Solid Waste Strategies

- Allow a broad range of approved materials for recycling.
- Promote such programs as "Don't Bag It" and backyard composting.
- Provide strong effective educational opportunities to inform citizens on how to better manage waste.

Air Quality Current Policies

- Encourage regional mass public transportation by working with other cities in the Metroplex to create efficient commuter rail, light rail, bus service, and other modes of mass transportation.
- Encourage development that reduces daily vehicle miles for commuters through the creation of growth centers.

Air Quality Recommended Policies

- Encourage the development of industries with minimal air emissions, which will allow continued economic growth while the Metroplex is under strict federal emissions standards.

Use of Alternative Fuels



The use of alternative fuels, such as propane, is one way the City of Fort Worth is helping to reduce air pollution in the Dallas-Fort Worth Metroplex. (Source: City of Fort Worth, 2001.)

- Encourage development that helps reduce higher temperatures in urban areas through the planting of shade trees and the use of appropriate highly reflective (high albedo) paving surfaces and roofing materials. Consider using City projects to demonstrate the effectiveness of these development practices.

Air Quality Strategies

- Reduce automobile emissions by using alternative fuel in City vehicles, where appropriate.
- Encourage citizens, City employees and contractors to follow ozone reduction steps throughout the year, and more so during the ozone season (May 1st through October 31st), particularly on Air Pollution Watch Days.
- Where appropriate, preserve mature trees, and plant additional trees to help the air filtering process and to reduce the ambient outdoor temperature.
- Determine the feasibility of an idling restriction ordinance for all vehicles.

Energy Conservation Current Policies

- Pursue methods to reduce energy consumption by City facilities.
- Pursue methods to reduce the impact of urban heat island effect on Fort Worth.
- Promote energy efficiency and use of renewable energy.

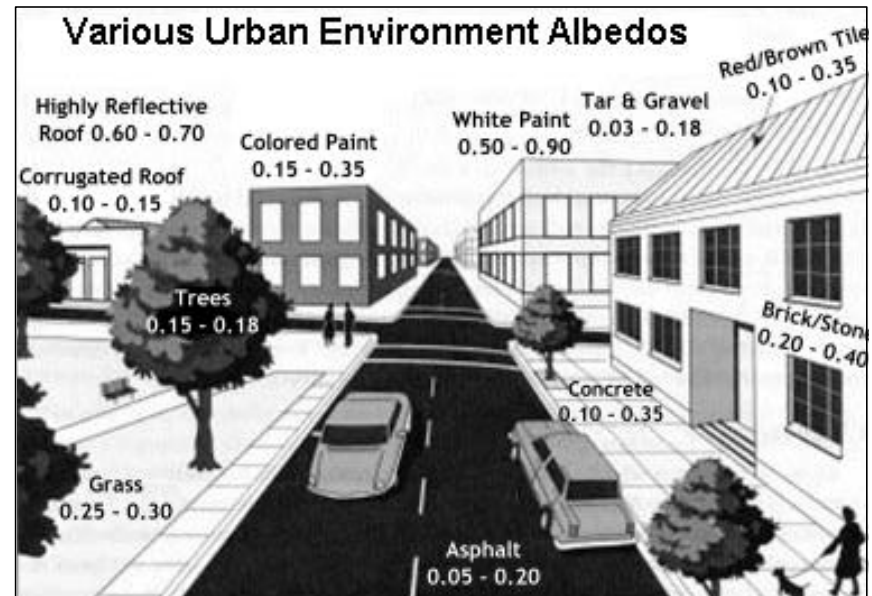
Energy Conservation Strategies

- Reduce the amount of electricity consumed by industrial, commercial, and residential customers through administration and enforcement of the Fort Worth Energy Code.
- Reduce the reliance of municipal facilities, businesses and residents on electricity produced by fossil fuel by encouraging the use of renewable energy sources in new development and redevelopment.
- Designate a lead department or a coalition of departments for the energy planning effort for City facilities. Assess energy use in City facilities; identify opportunities for energy conservation and implement appropriate measures; write and adopt an energy efficiency plan; train employees on energy conservation in daily activities; and, following implementation of the plan, monitor energy consumption to track progress and communicate results to City administrators, employees and elected officials to maintain awareness and interest in the program.
- On City projects, research options to increase the reflectivity of roofs and roads, driveways, and other paved surfaces that may include switching to light colored construction materials that reflect solar radiation and reduce surface and ambient air temperatures. Encourage other development in Fort Worth to implement this strategy.
- Plant shade trees near buildings and along paved surfaces to directly shield them from the sun's rays and reduce local air temperature and cooling energy demand. Adopt this strategy for City projects. Encourage other development in Fort Worth to implement this strategy.

Water Quality and Supply Current Policies

Chapter 18: Environmental Quality

Energy Conservation Strategies



Reflective (or high albedo) and emissive roofs bounce incoming solar radiation back into the atmosphere, reducing heat transfer through the building envelope. This effectively cools building interiors, reducing air conditioning demand. Light colored paving materials also reflect solar radiation and reduce surface and ambient air temperatures. (Source: U.S. Environmental Protection Agency, 2002.)

- Provide for handling wet weather flows in the sewer system in a cost-effective manner.
- Provide potable water in the service area as required by the projected growth.
- Assure adequate amount of raw water resources to meet projected growth demand.
- Provide water service in an effective manner and meet all federal and state standards for the residents of Fort Worth and the wholesale communities.
- Minimize impervious cover in areas of new development and significant redevelopment.
- Encourage redevelopment and infill in order to reduce the amount of new impervious surfaces.

Water Quality and Supply Strategies

- When feasible, develop linear parks with walking and biking trails along drainage ways as an effective means of filtering out water pollutants and connecting neighborhoods.
- Utilize natural areas to retain and filter storm water runoff.
- Reduce erosion and improve ground cover along drainage channels through effective design, construction, and maintenance.
- Support innovative efforts that are cost and environmentally effective in addressing water quality issues associated with new development and extensive redevelopment.
- Identify and address potential concerns regarding non-point source pollutant issues by providing information to parties involved in new and extensive redevelopment.
- Develop a detailed mitigation plan for increasing capacity and eliminating bottleneck conditions in areas presently subject to flooding.

Endangered Species and Natural Habitat Recommended Policies

- Protect riparian corridors as natural buffers along shorelines, which will filter pollutants and create natural habitats.

Endangered Species and Natural Habitat Strategies

- Seek opportunities and encourage developers to use natural landscapes.
- Develop and implement a plan for the designation and protection of Wildwood Bottoms at Lake Worth as a nature sanctuary for American Bald Eagles and other species.
- Develop and implement an ecotourism plan that is focused on the natural attractions of Fort Worth.

Sustainable Development Recommended Policies

- Increase the efficiency of providing City services by promoting development in mixed-use growth centers.
- Promote and facilitate the redevelopment of brownfields.
- Encourage building practices that limit environmental impacts.

Curbside Recycling Program



Fort Worth's curbside recycling program reduces the amount of waste going to landfills by 20 percent. The City Council directed staff to pursue an aggressive goal of diverting 25 percent of the city's total waste stream as part of the solid waste collection program implemented in spring 2003. (Source: Environmental Management Department, 2004.)

- Promote the use of natural vegetation on City property and in parks. (There are areas where this is not an appropriate or desirable goal, such as in historically significant parks like Capps, or in special venues such as the Water Gardens and the Zoo.)
- Where possible, the City should act as an example in developing facilities that are environmentally friendly.
- Implement a sustainable development online forum—an educational and networking resource that will inform the public about local opportunities and the benefits of sustainable development and that will increase builder participation.

PROGRAMS AND PROJECTS

Solid Waste Programs

- Garbage collection – The City provides a variable-rate based system for weekly garbage collection in carts. Customer pays for service based on the size of cart selected among 96-gallon, 64-gallon and 32-gallon options.
- Curbside recycling – The City provides single stream recycling collection once per week in 64-gallon carts. Cost of recycling collection and processing is included in the cost of residential sanitation service.
- Yard waste pick-up – The City provides weekly yard waste (grass clippings and small brush) collection in paper yard bags, bundled limbs, and optional (for purchase) 96-gallon yard carts. Material is kept separate from other waste and is mulched for compost or other reuse.
- Bulky item waste pick-up – The City provides a monthly, scheduled bulky item waste collection of up to 10 cubic yards of collected material at no extra charge.
- Drop-off Stations – The City currently operates two Drop-off Stations for resident use as an alternate means to dispose of bulky items and brush. The sites accept excess garbage and recycling as well. The City is also studying adding additional sites for drop off stations in each of Fort Worth's quadrants.
- "Don't Bag It" – The Environmental Management Department provides information on how to take care of lawns and yards without disposing of yard waste in the municipal waste stream.
- Education – The Public Education Section of the Environmental Management Department provides many options for education opportunities, such as recycling, backyard composting, garbology for children, litter reduction, and "Don't Bag It."
- Dead animal pick-up – The City removes dead animals from public rights-of-way on a request basis.
- Illegal Dump Cleanup – The Solid Waste Division of the Environmental Management Department created an illegal dump clean-up program in 1993 to help mitigate the effects of illegal dumping in Fort Worth.
- Captain Crud School Assemblies

Air Quality Programs

- Air monitoring program – The Air Quality program of the Environmental

Captain Crud



"Captain Crud" is a service mascot for the City of Fort Worth, created to help inform citizens about the household hazardous waste collection program and the benefits of recycling. (Source: Environmental Management Department, 2004.)

Management Department assists the Environmental Protection Agency (EPA) and TCEQ with air monitoring. The program is also involved with creating an air quality plan for the Metroplex.

- Inspection program – The Environmental Management Department is responsible for enforcing the Clean Air Act within Fort Worth. Along with the EPA and TCEQ, this department helps with permitting, compliance inspections, complaint investigations, and enforcement.
- Public Education Program – The Environmental Management Department has several positions dedicated to providing outreach to schools, PTAs, faith-based groups, neighborhood associations, City staff, and other organizations.
- Care for Cowtown Air – During ozone season (May – October), the Environmental Management Department offers incentives, in the form of prizes, to City employees who participate in ozone reducing activities. Because of this effort, the City of Fort Worth was named by the U.S. EPA as one of the “Best Workplaces for Commuters.”
- Clean Air Fair and Bike Rally – The Environmental Management Department holds an annual air fair and bike rally downtown to coincide with the start of the ozone season, as a means to educate the public on air pollution issues.
- Ozone-Forming Pollution Reduction programs – The City has committed to:
 1. Establish an Employee Transit Pass Program (E-Pass) and vehicle-miles traveled reduction study;
 2. Provide City employees with free parking at LaGrave Field; and
 3. Expand the Clean Vehicle Fleet Program, as the City Council deems appropriate.

Resource Conservation

Conservation Specialist - This Transportation & Public Works Department staff member works at the Facilities Management Group Manager to develop, implement and track the effectiveness of energy-and water-efficiency programs and projects for the City of Fort Worth. As part of this work, this specialist provides reporting to the State Energy Conservation Office (SECO) in order to comply with Texas Senate Bill 5/ *Texas Emission Reduction Plan* (SB5/TERP) amendments to the Texas Health and Safety Code 3888.005. Based on SB5/TERP, the City has set a goal of a 5-year, 5 percent per year reduction in electricity consumption, using 2001 as the baseline-year, to be targeted through implementing those conservation measures deemed cost-effective by the City. The City is on track to achieve this goal with a 16.5 percent electricity reduction through FY04.

- Conservation Programs
 1. The City is finalizing a major update of its 24-year old Municipal Energy Management Plan (MEMP) for planning and tracking the City’s facility resource conservation efforts. The draft utilizes a Performance Scorecard system to identify and develop Energy Data Management, Energy Supply Management, Facility Energy Use, System & Equipment Efficiency and Organizational Integration initiatives. Plans are for the finalization of this draft and adoption by the City in FY06.
 2. The City has completed and published major revisions to the Architectural Services Division’s “Design Guidelines for New & Existing Facilities” to more 177

Village Creek Wastewater Treatment Plant



The Village Creek Wastewater Treatment Plant in east Fort Worth is the primary unit that purifies the City’s wastewater. (Source: Fort Worth Water Department, 2001.)

- Education* – The Water Department and the Environmental Management Department have a variety of programs to educate the public on water resources and pollution prevention.
- Bioassessment Program – Evaluates the diversity and sensitivity of aquatic life found in selected city streams.
- Construction Inspection Program* – Obtains compliance from construction sites that are regulated by TCEQ.
- Household Hazardous Waste Collection Program* – Collects hazardous household wastes year-round and disposes of them properly for Fort Worth residents and many surrounding communities. Along with a fixed facility, a mobile collection unit is in operation.
- Industrial Inspection Program* – Obtains compliance from industrial facilities that are regulated by the EPA.
- Power Washers Program – Limits detergents and other pollutants from being discharged into the City's storm drain system.
- Spill Response Program* – Involves the Environmental Management and Fire Departments. Its purpose is to respond to spills that are discharging or threatening to discharge into the City's municipal storm sewer system.
- Storm Drain Marking Program* – Curb inlet markers containing a pollution prevention message advise citizens of the location of storm drains through markers. The program targets heavily trafficked locations with high visibility, areas with a past history of dumping or reported illicit discharge problems, and locations requested by citizens.
- Storm Sewer Outfall Screening* – Conducts dry and wet weather field screening of water in storm sewer outfalls to monitor pollutants entering water bodies in the city.
- Storm Water Characterization* – Through computer modeling and a highly technical analysis of storm water runoff, pollution control activities and trends are evaluated.
- Neighborhood Inlet Cleaning Program – Systematically inspects and cleans all curb inlets neighborhood by neighborhood to remove trash and to reduce the potential for blockages and flooding during storms.

** Indicates programs required by the National Pollutant Discharge Elimination System (NPDES) permit.*

Water Quality, Supply and Drainage Projects

- Raw water supplies – The Tarrant Regional Water District supplies raw water for Fort Worth and is developing projects to divert water from the Trinity River to supplement the yield of Richland-Chambers Land and Cedar Creek Lake in east Texas. Coupled with existing sources, the Trinity diversion projects will give the District adequate supplies to meet projected needs to the year 2020 and beyond. The City, in cooperation with the District, is studying other potential sources of water supply for the future, including Toledo Bend Lake, the proposed Marvin Nichols Reservoir, Brazos River Basin, and other possibilities.

Fort Worth Nature Center



On February 12, 1964, the Fort Worth Park Board designated a 360-acre location on upper Lake Worth as a “wildlife and nature preserve”. (Source: Parks and Community Services Department, 2004.)



- Infrastructure inventory – A detailed inventory of existing drainage features and their conditions is being prepared.
- Watershed studies – The City, in cooperation with NCTCOG, has started to identify developing areas and determine strategies to avoid downstream flooding in areas already developed. Strategies will be suggested on a watershed basis because drainage and water movement are based on these natural boundaries.
- The City has recently implemented modified design standards to reduce erosion and loss of vegetation along open channels.

Endangered Species and Natural Habitat Programs

- Outreach program – Coordinated by the Parks and Community Services Department, this program provides an opportunity for neighborhoods, schools, and businesses to act in an advisory capacity for natural landscape enhancements.

Endangered Species and Natural Habitat Projects

- Landscape restoration – The Parks and Community Services Department is coordinating landscape restorations of the Fort Worth Nature Center and Tandy Hills.

Sustainable Development Programs

- Brownfields Assessment Program – Funded through a grant from the U. S. Environmental Protection Agency, the Environmental Management Department is investigating potential brownfield sites and actively promoting their redevelopment.
- Municipal Setting Designation – The City enacted the state's first procedural ordinance for approval of a municipal setting designation (MSD). The ordinance is administered by the Environmental Management Department's Brownfields Program. The law establishing MSDs creates a means by which the scope of investigations and response actions addressing groundwater contamination may be limited by the Texas Commission on Environmental Quality, if the groundwater is prohibited for use as a potable water source by municipal ordinance or restrictive covenant. An MSD for a given site must be approved by the municipality in which the property is located.
- The City is using the U.S. Environmental Protection Agency's Project XL program to develop an approved method for local governments to demolish substandard nuisance structures containing asbestos more economically, while protecting the environment and the public health.

Sustainable Development Projects

- Environmental site assessment – Site assessments of properties within the Evans and Rosedale Business and Cultural District project area and within the LaGrave Field redevelopment project area have been completed, and ongoing

Brownfields Assessment Demonstration Pilot



The Evans and Rosedale neighborhood is a brownfields success in the making. The intersection of Evans and Pulaski is now home to a beautiful public plaza celebrating African-American heritage in Fort Worth.



Lead-contaminated soil was removed from the site, making it available for redevelopment.

monitoring of groundwater is being conducted. the 80 City-owned properties within the project area will be receiving Certificates of Completion from At Evans and Rosedale, nearly 8,000 cubic yards of lead-contaminated soil was removed, and 75 of TCEQ in 2005. Some additional cleanup is still needed on the five remaining sites. A master plan for the redevelopment of the project area was approved in 2004. Redevelopment of the area has begun, with the completion in 2004 of the reconstruction of Evans Avenue, complete with a new public plaza. In the fall of 2005 construction will begin on a new 30,000 square foot public health facility and 8,000 square foot public library branch, in addition to the renovation of the 4,800 square foot Tommy Tucker School, which will be part of the library facility. These facilities will be at the southern end of the project area.

- Brownfields Redevelopment Assistance– The City is providing brownfields redevelopment assistance to the developers of the Montgomery Park Business Center redevelopment project, and granted them the city’s first municipal setting designation in April 2005.

Capital Improvement Projects

The capital improvement projects that have been identified for the next 20 years are listed in Appendix D and Appendix E with estimated costs, completion dates, and potential funding sources. Projects are divided into three categories including drainage, water, and wastewater. There are 11 funded drainage projects totaling \$40 million and 181 unfunded drainage projects totaling \$559 million, 10 funded water projects totaling \$647 million and one unfunded water project totaling \$11 million, and 9 funded wastewater projects totaling nearly \$40 million and 3 unfunded wastewater projects totaling \$64 million.

